REMARKS

Preliminarily, Applicants respectfully request the Examiner to acknowledge the claim for foreign priority and receipt of the certified copy of the priority document (from the International Bureau). The certified copy of the priority document is lodged in PAIR with a mailing date of June 10, 2008.

Review and reconsideration on the merits are requested.

Claims 1 and 4 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,821,800 to Koide et al. The Examiner cited Koide et al as disclosing a pn junction type Group III nitride semiconductor light-emitting device substantially as claimed, including a second end barrier layer 5c in contact with p-type clad layer 7a that is thicker than the first end barrier layer 5a that is in contact with n-type clad layer 3b, wherein the second end barrier layer 5c is said to include n-type impurities, citing col. 5, lines 7-8 and col. 3, lines 34-41. Although acknowledging that Koide et al does not teach that the barrier layers other than the second end layer have a thickness of 15 nm or more and 50 nm or less, or that the second end layer has a thickness of 1.2 or more times than 2.5 or less times than the thickness of the barrier layers other than the second end layer, the Examiner was of the view that "the claimed range is considered to be an obvious matter of finding an optimum workable range for some chosen design requirement utilizing Koide et al. method."

The rejection should be withdrawn for the following reasons.

Although Fig. 1 of Koide et al would seem to show barrier layer 5c having a thickness greater than that of the first end barrier layer 5a, that is not what Koide et al says. Rather, Koide et al instructs that the light-emitting layer 5 is formed by repetitively laminating a 3.5 nm-thick barrier layer 5a and a 3.5 nm-thick quantum well layer 5b (col. 4, lines 55-57), and that a 3.5 nm-

thick barrier layer 5c is formed as an uppermost layer (col. 4, lines 61-62). That is, Koide et al teaches that the barrier layer 5c corresponding to the second end barrier layer has the same thickness as the first end barrier layer 5a. As described at col. 5, lines 3-6:

> It is preferred that the thickness of the uppermost barrier layer 5c be substantially equal to those of the other barrier layers 5a from the viewpoint of eliminating the quantum effect.

As described at page 3, line 32-page 4, line 2 of the specification, by making the thickness of the second end layer in contact with the p-type clad layer greater than that of the barrier layers other than the second end layer as required by present claim 1:

(i) carrier charged from the n-type clad layer is prevented from flowing toward the p-type clad layer; and

(ii) the light emitting output can be enhanced.

To the contrary, as noted above, Koide et al teaches that the barrier layer 5c preferably has the same thickness as that of the barrier layer 5a from the viewpoint of eliminating the quantum effect. Further, Koide et al neither discloses nor teaches a second end layer that is thicker than the barrier layers other than the second end layer.

Further, although Koide et al teaches that the barrier layers 5a, 5c and the quantum well layers 5b may have impurities doped there into (col. 5, lines 7-8), in Koide et al's embodiment the barrier layer 5a is made of GaN having no intentional impurities doped (col. 4, lines 56-57) and the barrier layer 5c is made of GaN also having no intentional impurities doped (col. 4, lines 62-63). The passage at col. 3, lines 34-41 of Koide et al cited by the Examiner has nothing to do with the doping of impurities into the second end barrier layer. Rather, this passage pertains to the In (indium) mole fraction (composition) of the barrier layers, and has no disclosure with regard to any impurity content of the barrier layers.

It is not at all easy to arrive at the claimed device where Koide et al directs one of ordinary skill to employ structures that are opposite those claimed.

The Examiner further considered that the thickness limitations of claim 1 are subject to routine optimization. However, a particular parameter must first be recognized as a result-effective variable, namely, a variable which achieves a recognized result, before the determination of the optimum or workable ranges of that variable might be characterized as routine experimentation (MPEP § 2144.05). The Examiner has not pointed to anything in Koide et al or the prior art which suggests that setting the barrier layers other than the second end layer to have a thickness of 15 nm or more and 50 nm or less and setting the second end layer to have a thickness of 1.2 or more times and 2.5 or less times the thickness of the barrier layers other than the second end layer achieves a recognized result. Further, not only does Koide et al fail to disclose or suggest such features, the Examiner has not cited any documents showing the subject claimed features. Thus, it is unclear how the Examiner could reasonably conclude that the thickness limitations of claim 1 relate to art-recognized result-effective variables "subject to routine optimization." To the contrary, Koide et al teaches at col. 5, lines 3-6 that all of the barrier layers preferably have the same thickness.

For the above reasons, it is respectfully submitted that claims 1 and 4 are patentable over Koide et al and withdrawal of the foregoing rejection under 35 U.S.C. § 103(a) is respectfully requested.

Claim 2 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Koide et al further in view of JP 7086637 to Itaya et al (JP '637). JP '637 was cited as teaching the limitation of claim 2 where each of the barrier layers has a thickness increased gradually from

the first end layer toward the second layer. Applicants rely on the response above with respect to the rejection of claims 1 and 4 over Koide et al alone.

Claim 3 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Koide et al as applied to claim 1 and further in view of JP 2001-102629 to Marui et al (JP '629).

Applicants respectfully traverse.

As discussed in the Remarks portion of the Amendment filed December 7, 2009, JP '629 discloses a 3-tier structured barrier layer composed of a bottom layer 7a-(1) formed of undoped GaN, a middle layer 7a-(2) formed of Si-doped GaN, and a top layer 7a-(3) formed of undoped GaN (paragraph [0033]).

However, among the 7 barrier layers, it is the barrier layers from the bottom layer to the 6th layer from the bottom that are the 3-tier structure barrier layers, while the barrier layer 7a' of the top layer is undoped (paragraphs [0033] and [0034]). Therefore, JP '629 does not teach the limitation of claim 3 where it is the second end layer that has the claimed impurity profile. Thus, JP '629 neither discloses nor teaches the limitation of present claim 3.

Withdrawal of the foregoing rejection is respectfully requested.

Withdrawal of all rejections and allowance of claims 1-4 is earnestly solicited.

In the event that the Examiner believes that it may be helpful to advance the prosecution of this application, the Examiner is invited to contact the undersigned at the local Washington, D.C. telephone number indicated below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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